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⑮ Lid Controller

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Huwil Works GmbH

February 23, 1999

In-Room Safes and Fittings Factories

Hw/kau (01219)

Broelstrasse 2

P99511DE00

53809 Ruppichterath

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### Lid Controller

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#### Description

The invention has to do with a controller for a downward opening lid.

Described in DE 26 53 106 C2 is a controller for a downward opening lid that has two arms, which are interconnected with each other on one end by means of a pivoting bolt joint. Each of the other two ends is equipped with connectors to attach to a fitting. One of the fittings is used to fasten onto the lid and the other for instance to fasten onto the body of a cabinet that the lid closes. One of the arms flares out wider in the area where the bolt joint is located and has two cam sections there. Both of the cam sections are arranged staggered at roughly 150° in relation to each other. The other arm has a slider made of plastic that can be moved lengthwise. The latter is preloaded with a spring in the direction of the joint bolt. The spring lies in a rectangular opening of the arm. The slider has a bore to be adjustable while resting on the arm and encompasses the arm and the spring. The slider's front surface facing the bolt joint forms a contact surface for the cam sections and is designed as a smooth sliding surface. It runs diagonally to the direction in which the slider is set. Adjoining the smooth sliding surface is an indentation. One of

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the cam surfaces produces a combined effect with the slider's contact surface in one of the arms' settings wherein they occupy a position of an opened lid so that the arms be supported. In a closed lid position the other cam surface in conjunction with an indentation surface produces an effect whereby the lid is drawn into a closed position. Other flat surfaces may be envisaged in order to allow for the lid to remain set in various intermediate positions.

The basic task of the invention is to create a controller that provides appropriate support strength for each of the arms' angle positions, from one based on the arms being closed in relation to each other to one with the lid opened in relation to them while they are in the widest possible angle to each other, and that allows furthermore for smooth closing.

The task becomes invention-related by means of a controller for upward opening lids with a first arm and a second arm, which are interconnected with each other by a pivoting bolt joint and each of which has connectors on the ends not interconnected, whereby the first arm is equipped with a control contour in the shape of a curve, the radial spacing around the pivot axis of which increases, starting from an initial position in which both arms are positioned with a greater angle with respect to each other through a part of the angular path traversed up to the second position, in which both arms are at a smaller angle with respect to each other, and at the end of the angular path decreases and forms a stop surface, whereby further the second arm houses a adjusting gate valve that is fitted with a spring having a support surface for attaching to the control contour and whereby the control contour and the support surface are designed to offset each other.

Advantageous here is that through the angular path a control contour matching the needed support strength is provided. Toward the second position, in which the arms are at the smallest angle with respect to each other, the support strength decreases, so that smooth closing is guaranteed.

By way of building up the invention scheduled is that the control contour encompasses two contact surfaces running at an acute angle to each other and the support surface encompasses two partial surfaces arranged in a V shape, which are part of the V-shaped cut. In so doing an increased surface of friction allowing for good support even in lids of great mass is provided.

For safe mounting of a lid in the closing position a straight line represents the decreasing radial distance to the end of the curve.

The angular path is further limited in a good way by the fact that on the control contour a stop is pre-switched that stands out over the curve and protects itself in the first position of the arms against the adjusting gate valve or against a counter-stop of the second arm.

Preferably the controller's components, with the exception of the plastic spring, are made manufacture from particular POM (polyacetate resin).

An invention-related controller and two execution forms are depicted in the drawing and described further by means of it.

It shows

Figure 1                      an exterior side view of the controller, partly cut away, whereby both arms are shown with lines drawn out at the widest possible angle with respect to each other in and in addition

for one arm the position at the smallest possible angle with the dotted lines,

Figure 2 a cut along a cutaway line A – A of Figure 1 for a first execution of the contact surface and the support surface and

Figure 3 the cut along cutaway line A – A of Figure 1 for an execution of a contact surface and a support surface after modification to Figure 2.

The controller according to Figures 1 and 2 encompasses a first arm 1 and a second arm 2, each of which pivots and is interconnected to the other at an end by a joint bolt 3 that forms the joint axis 4. At each of both of the other ends of both arms 1, 2 a connector bore 5, 6 is designed to be used as a pivoting connection with the fitting. The fittings are used in each case as attachment to a lid or a side wall of the body of a piece of furniture. In addition to the joint bolt 3 the first arm 1 has a molding providing a control contour 7 that is defined by the curve 8, 9. The contour 7, as shown in Figure 2, has two contact surfaces 7a and 7b, arranged diagonally and running into each other, i.e. V-shaped.

Starting from a first end that is located near a stop 10, which lies above the curve 8, 9, the curve 8, 9 runs in the first section 8 of the curve with increasing distance R to the joint axis 4. The first section of the curve 8 transitions into the second section of the curve 9, which is depicted as a straight line and in which therefore the R distance decreases back down to the joint axis R.

The second arm 2 has a lead cut 11 that is open toward the joint bolt 3 and contains in lead cut 11 an adjusting gate valve 12 that can move lengthwise along the second arm 2. It is pushed toward the control contour 7 by a spring 16.

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Viewed diagonally it has a V-shaped cut 14, as can be seen in Figure 2, with partial contact surfaces 13a, 13b, which form the support surface 13 compensating both surfaces 7a, 7b of the control contour 7. As can be seen in Figure 2, at the base of the V-shaped cut 15 is a groove that assures a two-dimensional contact between the partial surfaces 13a, 13b and contact surfaces 7a, 7b. In the modified execution in accordance with figure 3 the two-dimensional contact is achieved when both contact surfaces 7a' and 7b' end up in a flat portion 17 and both the partial surfaces 13' and 13b' taper off in a point.

The continuous lines in Figure 1 depict positioning of both of the arms 1, 2, wherein they occupy the largest possible angle A. In addition in the dotted lines the position is depicted in which both of the arms 1, 2 encompass the smallest possible angle B between them. At the same time, the adjusting gate valve 12, 12' is right on section of a curve 9 that run like a straight line in order to hold the lid in the closed position. A type of resting place is set up that has to be overcome with force when opening, i.e. moving toward an angle A.

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Reference Number List

- 1 first arm
- 2 second arm
- 3 pivot bolt
- 4 connector bore
- 5 connector bore
- 6 control contour
- 7a, 7a' Contact surface
- 7b, 7b' Contact surface
- 8 first curve section
- 9 second curve section / straight line
- 10 stop
- 11 Lead cut
- 12, 12' Adjusting gate valve
- 13 support surface
- 13a, 13a' Partial surface
- 13b, 13b' Partial surface
- 14 groove
- 15 V-shaped cut
- 16 spring
- 17 flat portion

A, B  
R

Angle  
Distance

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## Lid Controller

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### Protection Claims

1. Controller for upward opening lids,

with a first arm (1) and a second arm (2) that pivot interconnected with each other by means of a joint bolt (3) and have connectors (5,6) on their ends not interconnected with each other, whereby the first arm (1) is equipped with a control contour (7), which is depicted in the shape of a curve (8, 9), whose radial distance ( R ) created around the pivot axis (4) by the pivot bolt (3) increases, starting from an initial position in which both arms (1, 2) are positioned with a greater angle (A) with respect to each other through a part of the angular path traversed up to the second position, in which both arms (1, 2) are at a smallest angle (B) with respect to each other, and at the end of the angular path decreases and forms a stop surface, whereby further the second arm (2) houses in a movable way an adjusting gate valve (12, 12') that is fitted with a spring (16) having a support surface (13) for attaching to the control contour (7) and whereby the control contour (7) and the support surface (13) are designed to offset each other.

2. Controller according to claim 1,

thus signifies

that the control contour (7) encompasses two contact surfaces (7a, 7b; 7a', 7b') running at an acute angle to each other and the support surface (13) encompasses two partial surfaces (13a, 13b; 13a', 13b') arranged in a V shape, which are part of the V-shaped cut (15).

3. Controller according to claim 1,

thus signifies

that the increasing radial distance at the end of the curve (8, 9) is depicted as a straight line.

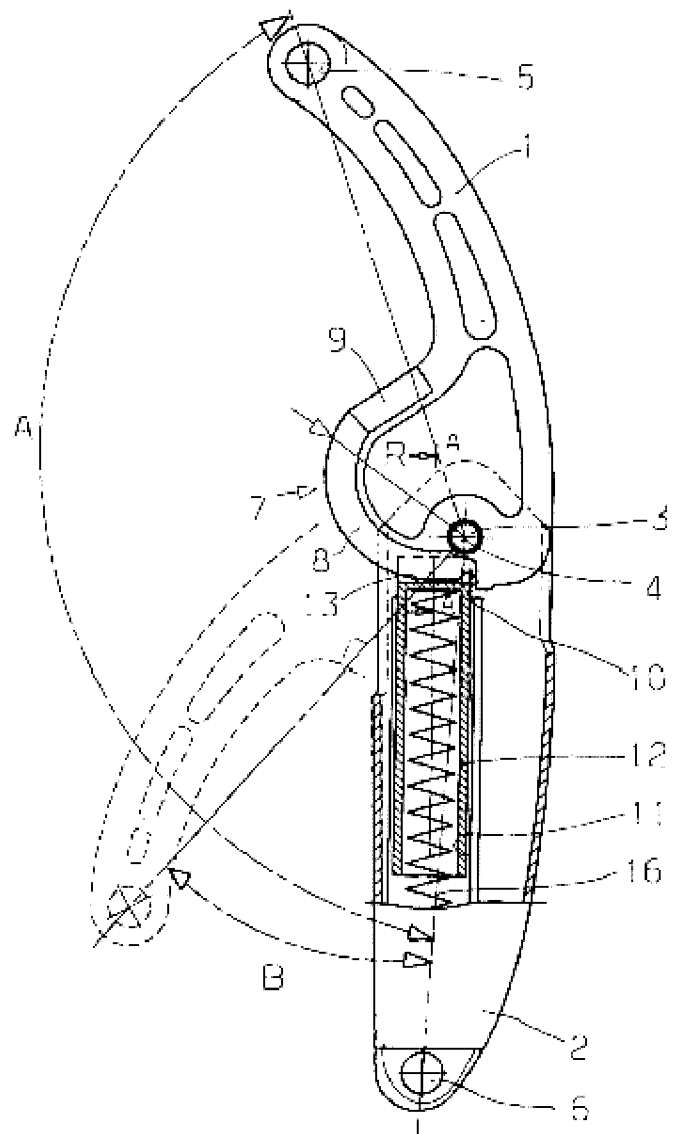
4. Controller according to claim 1,

thus signifies

that on the control contour (7) a stop (10) is pre-switched that stands out over the curve (8) and protects itself in the first position of the arms (1, 2) against the adjusting gate valve (12, 12') or against a counter-stop of the second arm (2).

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Fig. 1



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Fig. 2

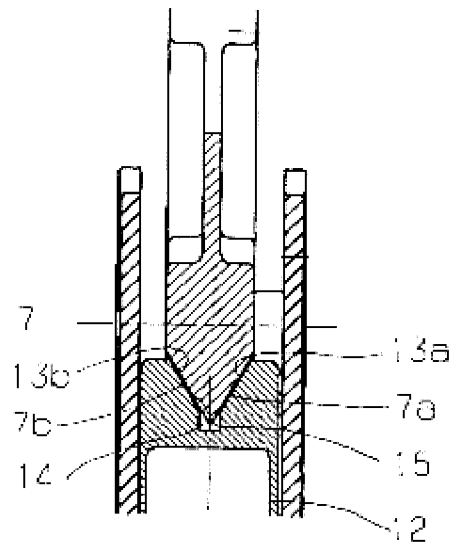


Fig. 3

